

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on February 4, 2003, and the references cited therewith.

No claims are amended or added. Claims 42-43, 59 and 72-78 are canceled. As a result, claims 77-99 are now pending in this application.

Affirmation of Election

Restriction to one of inventions of Group I or II was required:

As provisionally elected by Applicants representative, Charles E. Steffey, on January 24, 2003, Applicant confirms its election to prosecute the invention of Group II, claims 79-99.

The claims of the non-elected invention, claims 42-43, 59, and 72-78, are hereby canceled without prejudice. However, Applicant reserves the right to later file continuations or divisions having claims directed to the non-elected inventions.

Double Patenting Rejection

Claims 77-99 were rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,174,806 B1.

A Terminal Disclaimer in compliance with 37 CFR 1.321(b)(iv) will be provided once the Examiner confirms the presence of inventive subject in claims 77-99.

§103 Rejection of the Claims

Claims 79-86 and 90-99 were rejected under 35 USC § 103(a) as being unpatentable over Wolf in view of Chu (U.S. 5,783,471) and further in view of Dobson (U.S. 5,527,561).

The Office Action has the burden under 35 U.S.C. § 103 to establish a *prima facie* case of obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). To do that it must show that some objective teaching in the prior art or some knowledge generally available to one of ordinary skill in the art would lead an individual to combine the relevant teaching of the references. *Id.*

The *Fine* court stated that:

Obviousness is tested by "what the combined teaching of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 878 (CCPA 1981)). But it "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." *ACS Hosp. Sys.*, 732 F.2d at 1577, 221 USPQ at 933. And "teachings of references can be combined *only* if there is some suggestion or incentive to do so." *Id.* (emphasis in original).

The M.P.E.P. adopts this line of reasoning, stating that

In order for the Examiner to establish a *prima facie* case of obviousness, three base criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *M.P.E.P.* § 2142 (citing *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed.Cir. 1991)).

Applicant respectfully submits that the Office Action did not make out a *prima facie* case of obviousness because the Office action fails to show evidence of a suggestion or motivation to combine the patents as the Office Action proposed.

The Office Action relies upon the cited Wolf text as showing "Al-TiN-Ti-S1 contacts." The Office Action contends that Wolf shows forming the contacts by depositing a layer of Ti, followed by forming titanium nitride thereover, annealing to react the titanium with the substrate and form titanium silicide; and forming an overlying aluminum or tungsten layer.

The Office Action takes "official notice" that "annealing to form the silicide layer in an inert or nitrogen ambient and the particular aspect ratio of the trench" is "well known in the art to be used to prevent contamination of the device structure and that the claimed aspect ration was commonly used at the time the invention was made". Applicant respectfully traverses this taking of "official notice" and requests the Examiner to provide a reference that describes such an element. Absent a reference, it appears that the Examiner is using personal knowledge, so the Examiner is respectfully requested to submit an affidavit as required by 37 C.F.R. § 1.104(d)(2).

The Office Action concedes that Wolf does not show "forming a metal line on the conductive material over the contact hole and forming the aluminum or tungsten layer by a CVD

process using a pressure of at least 1.1 atmospheres.” The Office Action looks to the cited Chu patent, characterizing it as relating to the “forming of a metal line overlying a conductive interconnection structure.” The Office Action claims that it would have been obvious to one skilled in the art to modify Wolf as suggested by Chu “because this would allow for communication with other active regions in a memory array.”

Applicant respectfully notes that there has been no showing in the Office Action pointing to some teaching somewhere which provides the suggestion or motivation to combine prior art teachings as the Office Action proposes. The Office Action fails to provide a rationale for one to modify Wolf by turning to Chu. Note that Chu purports to show formation of conductive plugs 313 in contact holes and then forming a conductive layer over the plugs and etching the layer to form traces 316 and 317. There is nothing in either Chu or Wolf which shows or suggests using the conductive plugs as allegedly shown in Chu with the contact structure as purportedly shown in Wolf.

The Office Action additionally cites Dobson as showing the forming of a metal layer in a hole and then subjecting the structure to an elevated temperature and pressure (greater than 3000 psi) to form a via. The Office Action concedes that Dobson does not show force filling at a “pressure greater than 1.1 atmospheres.” The Office Action contends that it would be obvious to force-fill the conductive layer in the primary reference of Wolf “because this allows for the void free filling of high aspect ratio vias.” Wolf does not show high aspect ration vias and there is nothing in Dobson suggesting the applicability of its processes to the Al-TiN-Ti-Si contacts of Wolf.

The Office Action has not pointed to a teaching anywhere which would provide a suggestion or motivation to combine the Wolf and Dobson teachings as the Office Action proposes and then applies such a combination to solve the same or similar problem which the claimed invention addresses. The Office Action fails to provide a rationale for one to modify Wolf by turning to Dobson.

The Office Action does not state a *prima facie* case of obviousness because of its failure to provide evidence of a teaching or suggestion to combine aspects of the prior art as proposed in the Office Action.

Reconsideration and allowance of claims 79-86 and 90-99 is respectfully requested.

Claims 87-89 were rejected under 35 USC § 103(a) as being unpatentable over Wolf in view of Chu (U.S. 5,783,471) and further in view of Dobson (U.S. 5,527,561) as applied to claims 79-86 and 90-99 above, and further in view of Gardner et al. (U.S. 5,679,585).

This rejection relied upon the same combination of Wolf Chu and Dobson discussed above and additionally added a Gardner et al patent. Gardner was cited for performing an anneal at a temperature of less than 550 celsius and a pressure of at least two atmospheres. The conclusion in the Office Action that it would have been obvious to perform elevated pressure processing in Wolf as disclosed in Gardner et al “because the higher pressure ensures thermal contact of heated flowing gas across the substrate especially in small geometries where silicide is to be formed” does not meet the requirement that the rejection provide evidence of a suggestion or a motivation to combine the references and that *provide evidence* there exists a reasonable expectation of success in so doing. Here Wolf does not discuss that there is a reason to perform the anneal step at an elevated temperature which is lower than the one suggested in Gardner et al. Further, Gardner et al does not suggest any reason that its combination of anneal pressure and temperature would be useful in the formation of the AL-TiN-Ti-Si contacts of Wolf. Absent a showing of those reasons, the Office Action fails to state a *prima facie* case of obviousness.

Reconsideration and allowance of claims 87-89 is respectfully requested.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612) 373-6970 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743

Respectfully submitted,

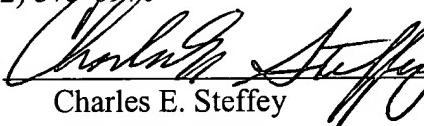
RANDHIR P. THAKUR ET AL.

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Date May 5, 2003

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents, P.O.Box 1450, Alexandria, VA 22313-1450, on this 5th day of May, 2003.